CSCE350 - Data Structures and Algorithms
Summer 2008 – Syllabus

Instructor
Chuming Chen
Telephone: (803)576-6308
Email: chen7@engr.sc.edu
Class Web Site: http://www.cse.sc.edu/~chen7/teaching/csce350/index.html
Office: SWGN 1D49
Office Hours: TTh 11:00am-12:00pm or by appointment

Time and Location
Lectures: MTWTH 12:30pm - 1:45pm, SWGN 2A15

Textbooks
Required: Anany Levitin, Introduction to the Design and Analysis of Algorithms, 2nd Edition. Addison Wesley, 2007. (ISBN 0-321-35828-7)

You are responsible for the material in the assigned readings. The lectures will be designed to complement this material. In addition, many of the homework problems will be assigned from this textbook.

Course Overview

CSCE350 is a course focused on the fundamentals of data structures and algorithms. We will cover techniques for representing and processing information, including the use of lists, trees, and graphs; analysis of algorithms; and sorting, searching, and hashing techniques.

Prerequisites
- CSCE245 - Object Oriented Programming
- MATH374 - Discrete Structures

Course Objectives
- Describe formal analysis measures
- Describe the relevance of abstraction to problem solving
- Analyze and use lists, trees, and graphs
- Apply common algorithm design techniques: brute force, divide-and-conquer, decrease-and-conquer, transform-and-conquer, dynamic programming, and the greedy technique
- Analyze algorithms
- Use appropriate data structures

Topics Covered
- Structured programming, stacks, queues, lists.
- Determining the running time of programs, order of magnitude analysis
- Brute force
- Divide-and-conquer
- Dynamic programming
- Transform-and-conquer
- The greedy technique
- Decrease-and-conquer
- Graphs
- Reviews and exams

Grading

Midterm Exam	Final Exam	Homework	Project
20%	30%	30%	20%

Letter grades correspond to the following percentages:

90-100	85-89	80-84	75-79	70-74	65-69	60-64	0-59
A	B+	B	C+	C	D+	D	F

Class Policies

Reading and Lectures
Students are expected to read all assigned material before the lecture begins. Attending lectures is mandatory.

Project
There will be a big programming project coupled with an in-class presentation (15-20 minutes) by each individual student. Project topics will be distributed early in the semester. Each student will come to the instructor to sign up for a different topic before midterm exam. Project topics are assigned to student by first come first serve order. Student can find a topic by himself/herself, but he/she has to discuss with the instructor and get the consent. The presentation time can be decided by the student and the instructor together but no later than July 10th.

Homework
There will be several homework assignments during this course. Usually, you will have 3 days to finish the homework and hand it in **before** the beginning of class (**12:30pm**) on the due date specified for each homework. **No late homework will be accepted.**

Exams
There will be a midterm exam and a final exam in this course. The midterm exam will be held on **Thursday, June 19, 2008, 12:30pm - 1:45pm at SWGN 2A15**. The final exam will be held on **Wednesday, July 23, 2008, 12:30pm - 1:45pm at SWGN 2A15**. Exams are accumulative. No make-up exams will be given except under extreme circumstances with a valid excuse, in which case you must give the instructor notice well before the exam if at all possible. **Missed exams due to unexcused absence will receive a score of 0**.

Grades
If you have questions regarding the grading of your programming projects, homework assignments, or exams, you must come to see the instructor within one week after the date that your programming projects, homework assignments, or exams were returned to you. If you cannot see the instructor within one week, you need to email the instructor within one week and make an appointment. If you believe that your programming projects, homework assignments, or exams have been lost, please check with the instructor as soon as possible (within one week). The instructor is not responsible for missing programming projects, homework assignments, or exams after they have been graded and returned.

Code of Student Academic Responsibility

Cheating
You are expected to know the **Academic Code of Responsibility** as it appears in the Carolina Community: Student Policy Manual. Students are expected to do their own work. Cheating behavior includes, but not limited to, giving or receiving unauthorized aid on a homework, quiz, test or project, or not documenting an outside source of information should one be used. Penalties for any behavior that constitutes cheating will be fully applied according to the University Policy.

Collaboration
Assignments should be done independently. It is permissible to discuss the problems at a high level with your classmates, but you should work out the details and compose the complete answers independently. Submission of identical or substantially identical work will be considered strong evidence that cheating has occurred.

Class Schedule

This is a tentative schedule only. It may be changed upon the development of the class.

Date	Topics	Readings	Remarks
June 2, 2008	**Lecture 1:** Introduction	Chapter 1.1-1.3	
June 3, 2008	**Lecture 2:** Fundamental data structures	Chapter 1.4	
June 4, 2008	**Lecture 3:** Formal analysis methods (1)	Chapter 2.1-2.2	**Last day to drop without "W"**
June 5, 2008	**Lecture 4:** Formal analysis methods (2)	Chapter 2.2-2.3	
June 9, 2008	**Lecture 5:** Formal analysis methods (3)	Chapter 2.3-2.4	
June 10, 2008	**Lecture 6:** Brute force (1)	Chapter 3.1-3.2	
June 11, 2008	**Lecture 7:** Brute force (2)	Chapter 3.4	
June 12, 2008	**Lecture 8:** Divide-and-conquer (1)	Chapter 4.1-4.2	
June 16, 2008	**Lecture 9:** Divide-and-conquer (2)	Chapter 4.2-4.3	
June 17, 2008	**Lecture 10:** Divide-and-conquer (3)	Chapter 4.3-4.4	
June 18, 2008	**Lecture 11:** Divide-and-conquer (4), Midterm review	Chapter 4.5-4.6	
June 19, 2008	**Midterm Exam (closed book), 12:30pm, regular classroom**		
June 23, 2008	**Lecture 12:** Decrease-and-conquer (1), Midterm analysis	Chapter 5.1-5.2	**Last day to drop without "WF"**
June 24, 2008	**Lecture 13:** Decrease-and-conquer (2)	Chapter 5.3-5.4	
June 25, 2008	**Lecture 14:** Decrease-and-conquer (3)	Chapter 5.5-5.6	
June 26, 2008	**Lecture 15:** Transform-and-conquer (1)	Chapter 6.1-6.2	
June 30, 2008	**Lecture 16:** Transform-and-conquer (2)	Chapter 6.3-6.4	
July 1, 2008	**Lecture 17:** Transform-and-conquer (3)	Chapter 6.5-6.6	
July 2, 2008	**No class**		
July 3, 2008	**No class**		
July 7, 2008	**Lecture 18:** Space-time tradeoffs	Chapter 7.1-7.4	
July 8, 2008	**Lecture 19:** Dynamic Programming (1)	Chapter 8.1-8.2	
July 9, 2008	**Lecture 20:** Dynamic Programming (2)	Chapter 8.2-8.3	
July 10, 2008	**Lecture 21:** Dynamic Programming (3)	Chapter 8.3-8.4	
July 14, 2008	**Lecture 22:** Greedy algorithms (1)	Chapter 9.1-9.2	
July 15, 2008	**Lecture 24:** Greedy algorithms (2)	Chapter 9.3-9.4	
July 16, 2008	**Lecture 25:** Iterative Improvement	Chapter 10.1-10.4	
July 17, 2008	**Lecture 26:** Limitations of algorithm power (1)	Chapter 11.1-11.3	
July 21, 2008	**Lecture 27:** Limitations of algorithm power (2)	Chapter 12.1-12.3	
July 22, 2008	**Lecture 28:** Final review	Chapter 1-12	
July 23, 2008	**Final Exam (closed book), 12:30pm, regular classroom**		